green phosphor. Alternatively, the white LED **110** may be formed of an ultraviolet (UV) LED chip, a red phosphor, a green phosphor and a blue phosphor. The red phosphor may utilize $CaAlSiN_3$:Eu which is a nitride composition, or (Ca, Sr)S:Eu which is a sulfide composition. Also, the green phosphor may adopt $(Ba_x, Sr_y, Mg_z)SiO_4:Eu^{2+}$, F, Cl ($0<x, y\leqq 2$, $0\leqq z\leqq 2$, 0 ppm≦F, Cl≦5000000 ppm), which is a silicate composition, $SrGa_2S_4$:Eu which is a sulfide composition, or β-SiAlON which is a nitride composition.

[0044] Moreover, the blue phosphor is formed of one of a silicate-based composition, a sulfide-based composition, a nitride-based composition, and an aluminate-based composition.

[0045] As described, when the white light is produced using the white LEDs **110**, only one chip is utilized to ensure easier manufacture of the backlight unit and simpler configuration of a circuit than the conventional method in which white light is obtained using red, green and blue LEDs **11**, **12**, and **13**.

[0046] Particularly, in the present embodiment, the plurality of white LEDs are arranged by adjusting, e.g., spacing D_1 of rows Lc, spacing D_2 of columns Lr of the white LEDs **110** or arrangement angles (θ) thereof. The white light emitting diodes are arranged such that a light emitting diode unit U defined by each of the white LEDs **110** and corresponding ones of the white LEDs disposed at a closest distance from the each white light emitting diode has a light amount in a center C ranging from 80% to 120% with respect to an average light amount of the white LEDs **110**. Here, the average light amount of the white LEDs **110** is derived by dividing a total light amount by the number of the white LEDs **110**.

[0047] Here, the LED unit U may have a triangular shape as shown in FIG. **3**. Alternatively, the LED unit U may have a square shape as shown in FIG. **4**. Therefore, the center C of the LED unit U may be a weight center of the three white LEDs **110** in the triangular shape (see FIG. **3**), or a weight center of the four white LEDs **110** in the square shape (see FIG. **4**).

[0048] Unlike the conventional configuration, the white light sources are arranged as in FIGS. **3** and **4** to define a polygon including a triangle. Here, the LED unit defined by the each light source and the corresponding ones of the light sources disposed at a closest distance, i.e., LEDs surrounding the center C as shown in FIGS. **3** and **4** has a central light amount, i.e., light amount measured in the center C ranging from 80 to 120% with respect to an average light amount. This ensures optimal uniformity as shown in FIG. **6**A.

[0049] The LED unit U has a shape not limited to the aforesaid ones but may be variously shaped as one of a polygon including a triangle, a circle and a combination thereof within the scope of the present invention.

[0050] When all measurements are based on the center of the LED unit, in FIG. **3**, a may be 20 to 140 mm, b and e may be adjusted in a range of 15 and 90 mm, respectively. That is, b and e, when are equal, assures optimal uniformity and b+e should be greater than a. Also, θ denotes an angle of one of the white LEDs located on a row line connecting an array of the white LEDs with respect to an adjacent one of the white LEDs located on another row line connecting an array of the white LEDs. For example, θ denotes an angle of b or e with respect to the line L connecting the array of the white LEDs. Referring to FIG. **3**, θ ranging from 70 to 110° ensures optimal arrangement of the white LEDs. D_1, and D_2, when ranging from 8.2 to 70 mm ensure optical uniformity.

[0051] In a similar manner, as shown in FIG. **4**, even when θ is substantially 90°, D_1, and D_2 range from 8.2 to 70 mm, respectively to ensure optimal arrangement.

[0052] The arrangement described above may employ light sources satisfying following conditions. Such arrangement is expected to result in superior color reproducibility and improve brightness.

[0053] The white LED light source of the present embodiment may include a blue chip having a dominant wavelength of 430 to 456 mm, a red phosphor disposed around the blue LED chip and excited by the blue LED chip to emit red light and a green phosphor disposed around the blue LED chip and excited by the blue LED chip to emit green light.

[0054] The red phosphor may have a color coordinate falling within a space defined by four coordinate points (0.6448, 0.4544), (0.8079, 0.2920), (0.6427, 0.2905) and (0.4794, 0.4633) based on the CIE 1931 chromaticity diagram. The green phosphor may have a color coordinate falling within a space defined by four coordinate points (0.1270, 0.8037), (0.4117, 0.5861), (0.4197, 0.5316) and (0.2555, 0.5030) based on the CIE 1931 chromaticity diagram.

[0055] The LCD backlight unit employing the white LED light source exhibits high color reproducibility as represented by a color coordinate space corresponding to an s-RGB area on the CIE 1976 chromaticity diagram (see FIG. **9**). This high color reproducibility cannot be achieved by virtue of a CCFL BLU, a combination of red, blue and green LEDs. i.e., RGB LED BLU and a conventional combination of a blue LED chip, and red and green phosphors.

[0056] Furthermore, an emission spectrum of the blue LED chip has a full width at half-maximum (FWHM) of 10 to 30 nm, the green phosphor **105** may have an FWHM of 30 to 100 nm and the red phosphor may have an FWHM of 50 to 200 nm. Each of the light sources has an FWHM ranging as described above, thereby producing white light with better color uniformity and color quality. Such FWHM conditions may be beneficially employed to enhance performance of the white LED light source. This FWHM range may be more beneficially applied in combination with other conditions such as the dominant wavelength of the blue LED chip and color coordinates of the red phosphor and green phosphor as described above.

[0057] Particularly, the blue LED chip may have a dominant wavelength set to a range of 430 and 456 nm and an FWHM set to a range of 10 to 30 nm. This significantly enhances efficiency of a $CaAlSiN_3$:Eu red phosphor and efficiency of a $(Ba_x, Sr_y, Mg_z)SiO_4:Eu^{2+}$, F, Cl ($0<x, y\leqq 2$, $0\leqq z\leqq 2$, 0 ppm≦F, Cl≦5000000 ppm) green phosphor.

[0058] That is, according to the present embodiment, the white LEDs **110** employed can be arranged with much less limitation than the conventional surface light source using the red, green and blue LEDs.

[0059] Moreover, according to the present embodiment, as described above, the LED unit U has a light amount in the center C ranging from 80% to 120% with respect to an average light amount of the white LEDs **110**, thereby ensuring a uniform light amount, and stable production and quality.

[0060] Here, in a case where the LED unit U has a light amount in the center C smaller than 80% of an average light amount of the white LEDs **110**, the white LEDs **110** are degraded in power efficiency to increase temperature and consumption power, thereby undermining uniformity. In a case where the LED unit U has a light amount in the center C greater than 120%, brightness can be increased but the white